

Mississippi Canyon 252

**ADDENDUM TO PREASSESSMENT PLAN TO DETERMINE POTENTIAL
EXPOSURE AND INJURIES OF NESTING AND HATCHLING LOGGERHEAD SEA
TURTLES AND LOGGERHEAD SEA TURTLE NESTS**

Approval of this Loggerhead sea turtle plan Addendum is for the purposes of obtaining data for the Natural Resource Damage Assessment. Each party reserves its right to produce its own independent interpretation and analysis of any data collected pursuant to this work plan.

This plan will be implemented consistent with existing trustee regulations and policies. All applicable state and federal permits must be obtained prior to conducting work. The field work described in this plan is already underway at the time of signature.

The trustees have developed a preliminary conceptual model of the DWH release, potential pathways and routes of exposure, and potential receptors. This preliminary model has informed the trustees' decision to pursue the studies outlined in the work plan. By signing this work plan addendum and agreeing to fund the work outlined, BP is not endorsing the model articulated in the addendum.

Jessica White for Lisa DiPinto
Department of Commerce Trustee Representative

9/14/2011
Date

Kevin D. Reynolds for Greg Maxson
Department of the Interior Trustee Representative

9/25/2011
Date

[Signature]
Louisiana Trustee Representative

FOR
KOLAM
GUIDRY

10/11/2011
Date

[Signature]
BP Representative

Sept. 15, 2011
Date

Mississippi Canyon 252

ADDENDUM TO PREASSESSMENT PLAN TO DETERMINE POTENTIAL EXPOSURE AND INJURIES OF NESTING AND HATCHLING LOGGERHEAD SEA TURTLES AND LOGGERHEAD SEA TURTLE NESTS

Introduction:

Potential impacts of oil and dispersants from the *Deepwater Horizon*/Mississippi Canyon 252 (MC 252) Oil Spill on Gulf coast loggerhead sea turtles (*Caretta caretta*) may range from mortality to sublethal stress and chronic impairment, including potential deleterious effects on reproduction and recruitment. Response and cleanup efforts may also cause impacts to nesting turtles, their nests, and hatchlings. Sublethal or latent effects, such as harm to the reproductive system, would not be detectable by physical examination. Nesting turtles and post-hatchlings may also be subject to continued exposure and adverse effects if oil, dispersant, and associated chemicals persist in the marine environment, including the marine food web. Indirect impacts from potential habitat degradation and loss of prey resources may reduce survival and reproduction.

A Technical Working Group (TWG) composed of technical experts and trustee agency representatives has been assembled to draft a work plan to assess potential injuries to loggerhead sea turtles along the coastline of the Gulf of Mexico in support of the ongoing Natural Resource Damage Assessment (NRDA) for the MC 252 Oil Spill. This Addendum to the 2010 PreAssessment Plan to Determine Potential Exposure and Injuries of Nesting and Hatchling Loggerhead Sea Turtles and Loggerhead Sea Turtle Nests (Plan or Addendum) is a component of the NRDA for the MC 252 Oil Spill. BP Exploration and Production, Inc. (BP) has participated in a review capacity.

Pursuant to OPA regulations, 15 C.F.R. §990.44, the Trustees issued their Notice of Intent to Conduct Restoration Planning in the case of Discharge of Oil from Deepwater Horizon/Macondo Well, Gulf of Mexico. (75 Fed. Reg. 60800 (Oct. 1, 2010)). This Plan provides for data collection to document potential injuries to loggerhead sea turtles consistent with the standard operating protocols (SOPs) referred to in this document.

Purpose:

The purpose of this Plan is to document potential exposure to MC 252 oil and dispersants (hereafter referred to as MC 252 oil) and associated impacts to the adult, hatchling and egg life stages of loggerhead sea turtles.

Objectives:

1. Assess nesting female physical condition, inter-nesting and post-nesting movements, and blood chemistry.
2. Collect samples to assess possible toxicological and physiological effects and impairments in nesting females, eggs, and hatchlings along the Florida and Alabama beaches in the Gulf of Mexico.

The intent is to achieve these objectives by conducting nesting female physical evaluations; satellite tracking of nesting female inter-nesting and post-nesting movements; collecting blood samples; collecting residual tissue samples from eggshells, non-viable eggs, and hatchlings. Nesting materials (sand) will be collected at natural nesting sites to identify potential impacts from MC 252 oil.

The sample analyses to be conducted will be described in a separate addendum. The Trustees provided a draft of the cooperative analytical addendum to BP on July 11, 2011. BP and the Trustees agree to work together in good faith to cooperatively develop this addendum, and agree that the addendum will include analyses for Polycyclic Aromatic Hydrocarbons (PAHs) and fingerprinting for MC252 oil, where technically practicable. However, if BP and the Trustees are unable to reach consensus on any individual element(s) of the analytical addendum, the Trustees reserve the right to proceed independently on those elements on which no agreement was reached. Regardless, for PAH analyses and MC252 oil fingerprinting of samples collected as part of this Addendum or the 2010 Preassessment Plan and requested by BP, the laboratory data sharing language below will apply. With the expectation that the total number of samples will not exceed 55, the Trustees agree to prioritize the analysis of carapace swipes and sand samples that are likely to have oil. BP agrees to fund the costs of laboratory results for PAH analyses and fingerprinting for MC 252 oil requested and received by BP outside of a cooperative analytical plan.

BP or its representative will be provided an opportunity to observe all sampling events occurring after the plan is signed, subject to logistical feasibility and permit requirements.

Background:

Five species of sea turtles nest on sandy beaches along the U.S. Gulf of Mexico coast from the Dry Tortugas, Florida, to the Texas/Mexico border: loggerhead (*Caretta caretta*), green (*Chelonia mydas*), Kemp's ridley (*Lepidochelys kempii*), leatherback (*Dermochelys coriacea*), and hawksbill (*Eretmochelys imbricata*). Nearly the entire Gulf coast supports regular sea turtle nesting except for the Big Bend area of Florida (Pasco County north through Wakulla County), which is largely composed of salt marsh. Satellite tracking indicates turtles may travel and forage within the entire Gulf of Mexico, both during (inter-nesting movements) and between (migratory movements) nesting seasons, making nesting turtles, and the eggs and hatchlings they produce, potentially susceptible to impacts and injury from the MC252 oil spill. Due to logistical

differences in management between loggerhead and Kemp's ridley turtles, this Addendum addresses adult nesting loggerhead turtles, eggs, and hatchlings. A separate addendum addresses Kemp's ridley turtles.

In the Gulf of Mexico, loggerhead turtles nest from the Dry Tortugas, Florida, to the southern coast of Texas and can extend to the beaches in Mexico. The greatest density of loggerhead nesting in the Gulf occurs along the southwestern coast of Florida in Sarasota County (range of 11 to 50 nests per kilometer documented from 2005 to 2009). Loggerhead nesting densities decrease along the northern and western Gulf of Mexico coasts with Alabama and western Florida Panhandle beaches documented as supporting a range of 0 to 5 nests per kilometer from 2005 to 2009 (Alabama Share the Beach Nesting Season Statistics <http://www.alabamaseaturtles.com/nesting-season-statistics/>; Florida Fish and Wildlife Conservation Commission (FWC) Marine Turtle Statewide Nesting Totals http://research.myfwc.com/features/view_article.asp?id=11812) and likely very few nests (less than 50 per year) being deposited in Mississippi, Louisiana, and Texas (G. Hopkins, Gulf Island National Seashore - Mississippi District, personal communication, 2010; Fuller and Lohoefer 1990; Padre Island National Seashore 2010 nesting season website (<http://www.nps.gov/pais/naturescience/current-season.htm>) [note that recent nesting surveys have not been conducted in Mississippi and Louisiana due to the difficulty of access to the beaches]). Three of five recovery units identified for the Northwest Atlantic population of the loggerhead occur in the Gulf of Mexico:

- ***Northern Gulf of Mexico Recovery Unit*** -- defined as loggerheads originating from nesting beaches from Franklin County on the northwest Gulf coast of Florida through Texas,
- ***Peninsular Florida Recovery Unit*** -- defined as loggerheads originating from nesting beaches from the Florida-Georgia border through Pinellas County on the west coast of Florida, excluding the islands west of Key West, Florida, and
- ***Dry Tortugas Recovery Unit*** -- defined as loggerheads originating from nesting beaches throughout the islands located west of Key West, Florida (National Marine Fisheries Service [NMFS] and U.S. Fish and Wildlife Service [FWS] 2008).

Female loggerheads nest every 2-5 years in the vicinity of their natal beach. During the nesting season, female turtles deposit multiple (2-6) clutches of 75-120 eggs on the beach at approximately 2-week intervals (Addison 1996, Sato et al. 1998, Hays et al. 2002, Schroeder et al. 2003, Tucker 2009, Hart et al. 2010). They then travel back to their foraging sites, to which they also show a high level of fidelity (Limpus et al. 1992, Plotkin 2003, Schroeder et al. 2003, Broderick et al. 2007, Girard et al. 2009). Natal beaches and foraging sites can be nearby or hundreds to thousands of kilometers away from each other. Although nesting turtles typically remain within the vicinity of a nesting beach during the inter-nesting period (Hart et al. 2010), they have also been observed making movements of greater than 100 km (Lamont 2002).

The possibility of oil exposure in nesting loggerheads is supported by pre-oil release tracking studies indicating that many loggerhead turtles in the Gulf of Mexico remain within the Gulf during the inter-nesting interval and between nesting seasons (Girard et al. 2009, Hart et al. 2010). Exposure to crude oil and its derivatives has previously caused lethal and sub-lethal

effects to adults, impacted egg production, and has caused embryo mortality and hatchling deformities (Fritts and McGehee 1982, Hall et al. 1983, Lutcavage et al. 1995). In addition, eggs exchange water and gases from the external environment possibly making them susceptible to physical and chemical effects of oil from oil-contaminated sand (Carthy 1996).

Study Area:

The study area includes all loggerhead nesting beaches from Alabama to the Dry Tortugas, Florida and along the beaches of Southeast Florida (study area). The Addendum includes a study site in Baldwin County, Alabama, which includes the Perdue Unit of the Bon Secour National Wildlife Refuge and adjacent private lands (Figure 1) (study site).

This Addendum is the second year of a study to assess the potential impacts of the MC 252 incident on nesting and hatchling loggerhead turtles and loggerhead turtle nests.

Sampling Design:

Nesting Loggerhead Assessments

Intensive nighttime surveys for nesting loggerhead turtles will be conducted at the study site in Baldwin County, Alabama (Perdue Unit of the Bon Secour National Wildlife Refuge and adjacent private lands) (Figure 1). The study site in Alabama hosts about 7 to 20 nests per year.

Satellite transmitters will be attached on up to 10 nesting turtles in Alabama in 2011. Five turtles will be fitted with Wildlife Computers SPOT5 satellite tags and up to five with Wildlife Computer Mk10 Fastlock GPS satellite tags (for a total of up to 10 satellite transmitters deployed), using established methods for sea turtle satellite telemetry (Seney and Landry 2008, Shaver and Rubio 2008, Hart et al. 2010). The Fastlock tags will be programmed to provide dive data, as well as to obtain GPS locations once per week.

For each nesting turtle encountered at the Alabama study site, field personnel will collect 10 milliliters of blood from the cervical sinus using Vacutainer® needles and tubes (Becton, Dickinson and Company, Franklin Lakes, New Jersey). The collection will occur only after the turtle has completed laying and is covering her nest or returning to the water; turtles that have not nested will not be disturbed as they return to the water. Blood samples will be partitioned for clinical chemistry, hematology and chemical analyses to be described in a separate analytical addendum.

The assessment will include a complete physical examination including examination of eyes and nostrils. Any lesions and abnormalities will be photographed and described on the data sheet. The nests used by these females will be marked and monitored throughout incubation. Three days after first signs of hatchling emergence, the nests will be excavated and up to 10 randomly selected unhatched eggs will be collected per nest and sent to the lab for processing and analysis. The purpose of this collection is to assess the nesting turtle physical condition and blood

chemistry, and the possible transfer of oil and constituents [e.g., polycyclic aromatic hydrocarbons (PAHs)] to the eggs.

After hatchlings have emerged, a grab sand sample will be collected during nest inventories from the inside of the nest cavity. The sample will be stored in a chemically clean glass jar on ice or in a refrigerator as per the SOP until shipment to the appropriate laboratory.

Extent of potential exposure to turtles that nest in Alabama, Florida Panhandle, Southwest Florida, and Southeast Florida

In 2011, a total of 50 nests will be selected randomly from the study area beaches in Alabama, the Florida Panhandle, Southwest Florida, Dry Tortugas, and Southeast Florida (Figure 2). Following hatchling emergence, up to 10 random unhatched eggs per nest will be collected from each of those randomly selected nests and sent to the lab for processing and analysis. Frequency and degree of deformities in hatchlings (dead and alive) and embryos will be photographed and described in the field notes.

Permitting:

The appropriate state and federal permits, including research permits for National Park Service lands and special use permits for U.S. Fish and Wildlife Service Refuge lands, will be secured prior to any field activities (Fish and Wildlife Service Permit number TE 12415A-0).

Sample and Data Handling:

MC 252 NRDA chain-of-custody procedures will be observed at all times for all samples. All samples will be transferred with appropriate chain-of-custody forms and all samples that will undergo chemical analysis will be shipped to appropriate laboratories for processing and analysis. Camera memory cards (to include GPS locations) will be handled under Chain-of-Custody after a card is full or after the study is completed pursuant to the NRDA protocol for transferring and uploading digital photos.

All field and laboratory data will be collected, managed, and stored in a secure facility under trustee control in accordance with written SOPs. The appropriate training on particular equipment or in the conduct of specific field studies for all personnel involved with the project shall be documented and those records kept on file for the duration of this project.

All materials associated with the collection or analysis of samples under these protocols or pursuant to any approved work plan, except those consumed as a consequence of the applicable sampling or analytical process, must be retained unless and until approval is given for their disposal in accordance with the retention requirements set forth in paragraph 14 of Pretrial Order # 1 (issued August 10, 2010) and any other applicable Court Orders governing tangible items that are or may be issued in MDL No. 2179 IN RE: Oil Spill by the Oil Rig "DEEPWATER HORIZON" (E.D. LA 2010). Such approval to dispose must be given in writing and by a person authorized to direct such action on behalf of the state or federal agency whose employees or contractors are in possession or control of such materials.

Data Sharing

Copies of all field data collected in accordance with this plan, including raw data, field sheets, and field notes, will be transferred to the NOAA NRDA Sample Intake Team following NRDA data management protocols. An identical copy of all documentation will be provided to BP and/or its designated representative and the Louisiana Oil Spill Coordinator's Office (LOSCO) within a reasonable timeframe once data intake, QA analyses and data entry procedures are complete but no later than 45 days after the non-analytical data are collected. *Non-analytical* data includes field sheets, photos, photo logger forms and GPS files. For non-analytical data collected before the Addendum is signed, such data shall be shared not later than 45 days after the Addendum is signed. All non-analytical data generated from this Addendum, if signed by November 1, 2011, will be provided to BP by November 30, 2011, with the exception of the telemetry data. Telemetry data will be made publicly available on www.seaturtle.org after a 7 day delay for QA/QC review and will be provided until such time as the telemetry devices cease to operate. Raw telemetry data will be provided to BP upon request.

All samples collected pursuant to this Addendum will be submitted to laboratories that are operated in a manner that is consistent with the guidelines of the Analytical Quality Assurance Plan for the Mississippi Canyon (Deepwater Horizon) Natural Resource Damage Assessment (version 2.2 or later). (See Appendices A and B for data collected pursuant to this plan which will be provided to BP/Cardno/ENTRIX and LOSCO).

Assuming the parties execute a cooperative analytical addendum for laboratory testing, laboratory results will be provided consistent with the laboratory data sharing language in the following paragraph:

Each laboratory shall simultaneously deliver raw data, including all necessary metadata, generated as part of this Addendum as a Laboratory Analytical Data Package (LADP) to the trustee Data Management Team (DMT), the Louisiana Oil Spill Coordinator's Office (LOSCO) on behalf of the State of Louisiana and to BP (or Cardno/ENTRIX on behalf of BP). The electronic data deliverable (EDD) spreadsheet with pre-validated analytical results, which is a component of the complete LADP, will also be delivered to the secure FTP drop box maintained by the trustees' Data Management Team (DMT). Any preliminary data distributed to the DMT shall also be distributed to LOSCO and to BP (or Cardno/ENTRIX on behalf of BP). Thereafter, the DMT will validate and perform quality assurance/quality control (QA/QC) procedures on the LADP consistent with the authorized Analytical Quality Assurance Plan, after which time the validated/QA/QC'd data shall be made available simultaneously to all trustees and BP (or Cardno/ENTRIX on behalf of BP). Any questions raised on the validated/QA/QC results shall be handled per the procedures in the Analytical Quality Assurance Plan and the issue and results shall be distributed to all parties. In the interest of maintaining one consistent data set for use by all parties, only the validated/QA/QC'd data set released by the DMT shall be considered the consensus data set. In order to assure reliability of the consensus data and full review by the parties, no party shall publish consensus data until seven days after such data has been made available to the parties. Also, the LADP shall not be released by the DMT, LOSCO, BP or Cardno/ENTRIX prior to validation/QA/QC absent a showing of critical operational need. Should any party show a critical operational need for data prior to validation/QA/QC, any

released data will be clearly marked "preliminary/unvalidated" and will be made available equally to all trustees and to BP (or Cardno/ENTRIX on behalf of BP).

Laboratory data sharing provisions in this Addendum pertain to and are contingent upon a cooperative analytical addendum being developed as discussed under Objective 2, above. The laboratory data sharing provisions do not apply to laboratory data generated independently, except for PAH and fingerprinting MC252 oil as previously referred to in this Addendum.

Within 30 days of the execution of this Addendum, the Trustees shall provide BP with an inventory of the 2010 samples. The Trustees will provide updates to the inventory to BP no less than every 45 days thereafter to reflect the collection of samples under this 2011 Addendum. The inventory will indicate whether a sample has undergone laboratory testing for PAHs or fingerprinting for MC252 oil.

Budget

As detailed in the budget below, the total field cost for this Plan is \$184,120. The Parties acknowledge that this budget is an estimate, and that actual costs may prove to be higher. BP's commitment to fund the costs of this work includes any additional reasonable costs within the scope of this approved work plan that may arise. The trustees will make a good faith effort to notify BP in advance of any such increased costs.

In addition, BP agrees to fund the cost of laboratory results for PAH analyses and fingerprinting for MC252 oil requested and received by BP outside of a cooperative analytical plan.

		2011 Field Work Only	
Deep Water Horizon NRDA - Loggerhead Sea Turtle 2011 Field Program Budget			
Project/Item		Unit	2011
U.S. Fish and Wildlife			
Alabama Night Surveys			
Refuge-use of ATV's		\$	200.00
Field Office-Fuel Costs		\$	451.00
FWS Direct Costs		\$	651.00
FWS Indirect costs		\$	338.52
FWS - TOTAL		\$	989.52
USGS Davie Field Office			
Alabama Night Surveys			
5 SPOT5 satellite tags (plus \$200 shipping)	\$ 1,350.00	\$	6,950.00
Satellite Time for 2011 10 tags (\$15/day/animal, est. 250 days)		\$	37,500.00
Satellite Time for 2010 Tags 10 tags (\$15/day/animal, est. 250 days)		\$	37,500.00
Fuel		\$	10,000.00
Vehicles: 2 GSA leases for 6 months each		\$	12,000.00
Supplies (coolers, vacutainers, PIT tags, turtle corrals, epoxy)		\$	5,000.00
Use of ATV's		\$	4,000.00
USGS Davie Direct Costs		\$	112,950.00
USGS Davie Indirect Costs (40% of direct costs)		\$	45,180.00
USGS Davie Field Center		\$	158,130.00
NOAA			
5 MK10 Fastlock GPS satellite tags (prepaid)	\$ 5,000.00	\$	25,000.00
TOTAL		\$184,120.52	
Deep Water Horizon NRDA - Loggerhead Sea Turtle 2011 Field Program Budget		2011 Pre-Assessment	

Durable Goods: All durable equipment (such as cameras, GPS, etc.) purchased by BP for this study will be returned to BP or their designated representatives at the conclusion of its use for this study unless otherwise agreed. Radio tags that are recovered or are not deployed will be returned to BP or its designated contractor at the end of this study, unless otherwise agreed.

Some of the equipment needed for this study may be in BP's existing inventory. BP-owned equipment will be used if available and when appropriate to the needs of the proposed work.

Coordinators:

Name and Affiliation	Role	Contact Information
Ann Marie Lauritsen U.S. Fish and Wildlife Service	Trustee Representative, Federal Permitting Consultant	904-731-3032 ann_marie_lauritsen@fws.gov
Dr. Robbin Trindell Florida Fish and Wildlife Conservation Commission	Trustee Representative, Lead Investigator for Florida nesting beach analysis and State Permitting Consultant	850-922-4330 robbin_trindell@fwc.state.fl.us
Jackie Isaacs/Dianne Ingram U.S. Fish and Wildlife Service	Lead Investigators for Alabama	251-540-7720 jackie_isaacs@fws.gov 251-441-5839 dianne_ingram@fws.gov
Dr. Margaret M. Lamont U.S. Geological Survey/	Lead Investigator for egg content sampling in AL and FL Panhandle	352-209-4306 mmlamont@mindspring.com
Dr. Raymond R. Carthy U.S. Geological Survey/University of Florida	Co-Lead Investigator for egg content sampling in AL and FL Panhandle	352-846-0545 352-213-5851 rayc@zoo.ufl.edu
Dr. Heath Rauschenberger U.S. Fish and Wildlife Service	Trustee Representative, Toxicology Consultant	904-358-3203 heath_rauschenberger@fws.gov
Dr. Kristen Hart U.S. Geological Survey	Co-Lead Investigator for AL, Egg Collections South Florida	954-236-1067 cell 954-650-0336 kristen_hart@usgs.gov

Data Collection Summary Outline:

Turtles

- Collect blood from nesting turtles in Alabama
- Satellite track movements of nesting turtles in Alabama
- Collect carapace swipes of nesting turtles in Alabama with visible signs of oil
- Conduct a health assessment on nesting turtles in Alabama that will include a complete physical examination including examination of eyes and nostrils; describe and photograph any lesions and abnormalities, pending approval by the Lead Investigator and agency experts

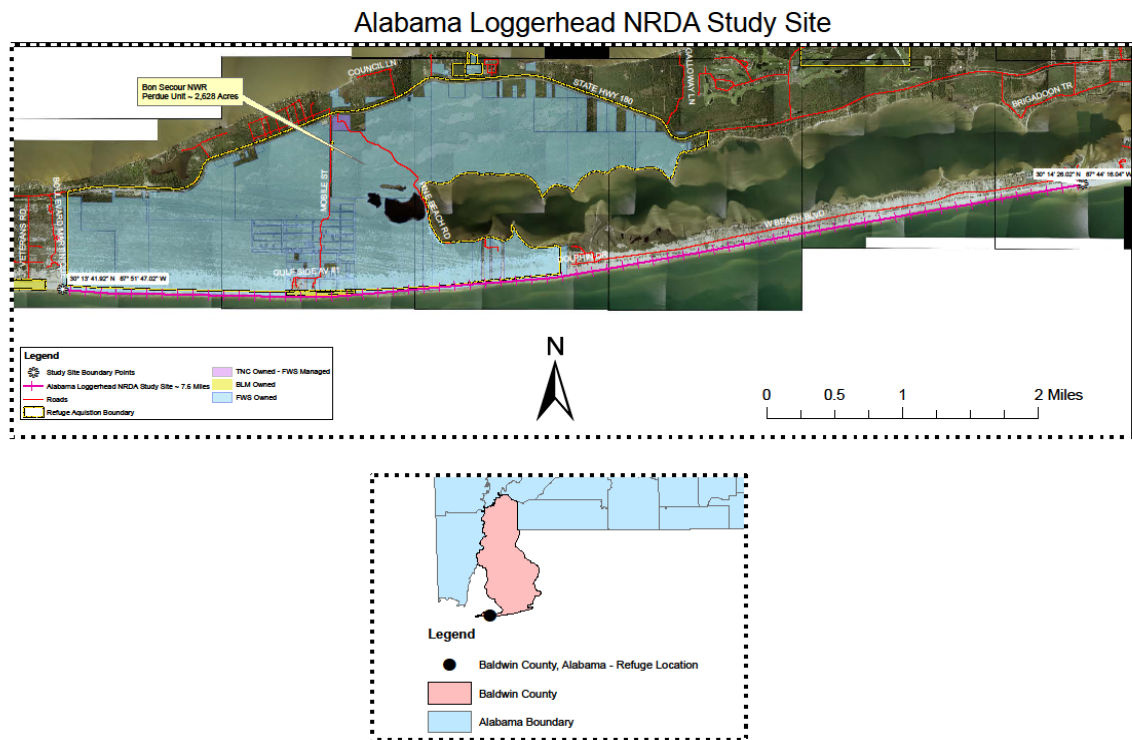
Nests

- Collect unhatched eggs: up to 10 random samples per randomly selected nest (up to a total of 50 nests from the study area of Southeast Florida, Southwest Florida, Florida Panhandle, Dry Tortugas, and Alabama)
- After hatchling emergence, collect one sand core from the inside of the nest cavity where unhatched eggs are collected.

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-Bon Secour NWR headquarters located at 12295 State Highway 180; Gulf Shores, AL 36542. Office number: 251-540-7720.
Map Created by USFWS on 11/09/10

Figure 1. Primary study site in Baldwin County, Alabama.

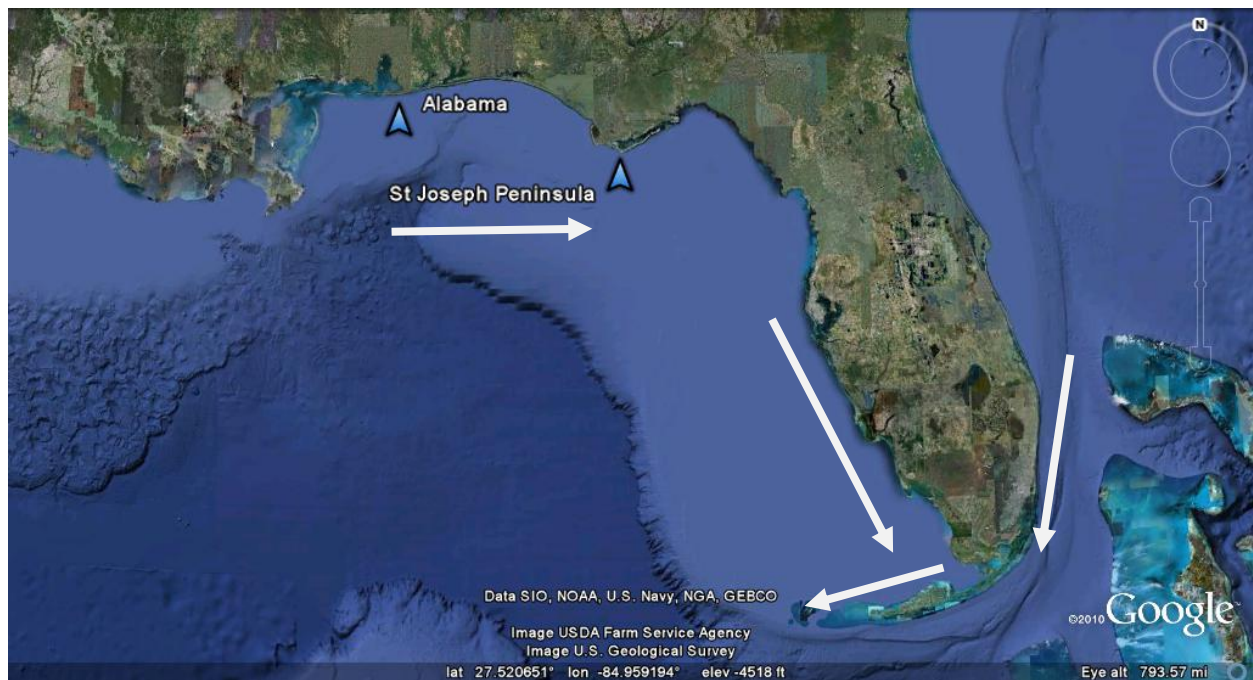


Figure 2. Study area includes extent of nesting beaches from Alabama to the Dry Tortugas, Florida, and along the beaches of Southeast Florida.

Sea Turtle Data Sheet

APPENDIX A-2011 Loggerhead Nesting NRDA Addendum

Species _____

Nest Number:

Observers:

SCL tip	
SCL notch	
SCW	
CCL tip	
CCL notch	
CCW	
SCH	
Recapture PIT tag #	Y/N
PIT tag sticker	
R flipper tag #	BSC
L flipper tag #	BSC
Digital Photos #	
Video	
Satellite tag #	
Mass	
NOTES: Describe any injuries/abnormalities:	

Capture Date	
Capture Location	
Gear Type	
GPS	N
	W
Time	
Release Date	
Release Location	
GPS	N
	W
Fibropapillomas?	Yes No
NOTES	
Blood	
Sample/Sample ID	
FTA card #	
Tissue Sample	tube #
1. DMSO genetics	
2. Ethanol genetics	
Swab/Swab Sample ID	

APPENDIX B -Loggerhead NRDA Nest Sample Data Sheet

Inventory/Collection Date: _____ Nest Number: _____

Species: _____ Date laid: _____

Sampled by: _____

Nest GPS location: _____N, _____W Stakes in place?: Yes No

Nest from female that was sampled?: Yes No Emerged?: Yes No

Female Tag #: left _____ right _____

Unhatched egg Sample ID #: _____

Sand Sample ID #: _____

Photo collected (GPS and nest): Yes No

Total clutch size: _____ Live hatchlings: _____

Hatched: _____ Dead hatchlings: _____

DEVELOPMENT ARRESTED AT:

Early stage mortality: _____ Addled: _____

Late stage mortality: _____ Infertile: _____

Pipped dead: _____ Pipped live: _____

Hatchling deformities (photograph and collect)
ID#: _____

EGGS AFFECTED BY (please describe if nest was affected by predators or inundation):

HATCHLING SUCCESS (number of hatched/clutch size): _____

HATCHLINGS EMERGED (hatched-dead hatchlings): _____

NOTES: _____
